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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/665,206	09/22/2003	Tetsuya Kurosawa	04173.0438	5743

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FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER
LLP
901 NEW YORK AVENUE, NW
WASHINGTON, DC 20001-4413

EXAMINER

OSELE, MARK A

ART UNIT	PAPER NUMBER
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1734

DATE MAILED: 07/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/665,206

Applicant(s)

KUROSAWA, TETSUYA

Examiner

Mark A. Osele

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 6-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 4, 6-8, and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nam et al. in view of Bura, Davis et al., and either Cobbley et al. or the admitted prior art Nam et al. shows a method and apparatus for manufacturing a semiconductor device comprising: sectioning semiconductor elements, 72, from a semiconductor wafer; picking up the sectioned semiconductor element from a holding member, 56; sticking an element adhesive film, 68, which is sectioned according to the shape of the semiconductor element, to the back surface of the element; and adhering the semiconductor element to a semiconductor device forming base material, 66, by the adhesive film (paragraphs 0027-0030).

Bura et al. teaches that applying adhesive to the semiconductor element rather than the base material is advantageous because the semiconductor element provides an accurate gauge for how much adhesive to apply (column 2, lines 13-17). It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the adhesive film of Nam et al. onto the semiconductor element rather than the base material because Bura et al. teaches this system to yield greater accuracy of adhesive application.

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In addition, Bura et al. teaches the use of a protective foil on the adhesive film adhered to the semiconductor element which is peeled off prior to bonding the semiconductor element to the base material (column 2, lines 46-53).

Davis et al. teaches that dies from a semiconductor wafer can be picked from a holding member in the order that they are to be used (column 3, lines 8-18, column 5, lines 8-29). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the pick up the semiconductor elements of the method of the references as combined in the order that they will be used because Davis et al. teaches that this is more efficient than previous pick and place methods.

Cobbley et al. (Abstract, Fig. 4C) and the admitted prior art (paragraph 0008 of the instant specification) teach that stacking of semiconductor elements improves the packing density of a semiconductor board so that boards can have a smaller footprint. Furthermore Cobbley et al. teaches that the semiconductor elements are stacked to each other before being applied to the board. It would have been obvious to one of ordinary skill in the art at the time the invention was made to stack the elements of the references as combined on the semiconductor board because Cobbley et al. and the admitted prior art show that the packing density can be increased to decrease the size of the semiconductor board.

Regarding claims 4 and 7, Nam shows the adhesive film is supplied from a supply roll and cut according to the shape of the semiconductor element by mechanical cutting using a knife, 48 (paragraph 0028).

Regarding claim 8, Nam shows the film cutting section has an adsorption member, 52, for holding the adhesive film and a cutting mechanism, 48, for cutting the element adhesive film held by the adsorption member.

Regarding claims 15 and 16, Cobbley et al. shows that the semiconductor elements can be stacked with the second element protruding from the outside shape of the first element because this may be advantageous in various applications (paragraphs 0034 and 0035; Figs. 5B, 5C, 5D).

3. Claims 2, 3, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nam et al. in view of Bura, Davis et al., and either Cobbley et al. or the admitted prior art as applied to claims 1 and 6 above and further in view of Sasaki et al.

Sasaki et al. teaches that it is conventional to adhere a first holding member to the front of a semiconductor wafer, backgrind the rear of the wafer, apply a second holding member to the rear of the wafer, dice the wafer from the front of the wafer, and use push up pins to separate the semiconductor element from the second holding member (column 1, line 26 to column 2, line 7). It would have been obvious to one of ordinary skill in the art at the time the invention was made to add the conventional steps of Sasaki et al. into the method of Nam et al. in order to create the diced wafer of Nam et al. because these steps are shown to be the conventional approach to creating individual elements on a holding member.

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4. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nam et al. in view of Bura, Davis et al., and either Cobbley et al. or the admitted prior art as applied to claims 1 and 6 above and further in view of Rogowski. As shown in paragraph 2 above, the references as combined show all of the instantly claimed limitations except for the adsorption member to be made of a porous metal. Rogowski teaches that porous metal plates over vacuum sinks allow for positioning of light weight sheets without deforming the sample into the pore sinks (column 4, lines 51-59). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a porous metal adsorption member in the apparatus of Nam et al. because Rogowski teaches that these are advantageous in preventing deformation when positioning thin sheets and the adhesive film of Nam et al. is a thin sheet.

5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nam et al. in view of Bura, Davis et al., and either Cobbley et al. or the admitted prior art as applied to claims 1 and 6 above and further in view of either Wojewnik et al. or Varaprasad et al. As shown in paragraph 2 above, the references as combined show all of the instantly claimed limitations except for the cutting means to be a laser. Wojewnik et al. and Varaprasad et al. each teach that laser cutters and cutting blades are interchangeable when cutting a film to a desired shape for bonding to a substrate (Wojewnik et al., column 4, lines 43-48; Varaprasad et al., column 32, lines 27-39). It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the cutting blade of Nam et al. with a laser cutter because Wojewnik et

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al. and Varaprasad et al. each show them to be interchangeable for the purpose of cutting a bondable film to the shape of a substrate.

6. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nam et al. in view of Bura, Davis et al., and either Cobbley et al. or the admitted prior art as applied to claims 1 and 6 above and further in view of either Wojewnik et al. or Varaprasad et al. as applied to claim 10 above and further in view of Rogowski. As shown in paragraph 2 above, the references as combined show all of the instantly claimed limitations except for the adsorption member to be made of a porous metal. Rogowski teaches that porous metal plates over vacuum sinks allow for positioning of light weight sheets without deforming the sample into the pore sinks (column 4, lines 51-59). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a porous metal adsorption member in the apparatus of the references as combined because Rogowski teaches that these are advantageous in preventing deformation when positioning thin sheets and the adhesive film of the references as combined is a thin sheet.

7. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nam et al. in view of Bura, Davis et al., either Cobbley et al. or the admitted prior art, and Sasaki et al. applied to claim 12 above and further in view of Rogowski. As shown in paragraph 3 above, the references as combined show all of the instantly claimed limitations except for the adsorption collet to be made of a porous metal. Rogowski

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teaches that porous metal plates over vacuum sinks allow for positioning of light weight sheets without deforming the sample into the pore sinks (column 4, lines 51-59). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a porous metal adsorption member in the apparatus of the references as combined because Rogowski teaches that these are advantageous in preventing deformation when positioning thin sheets and the electronic component of the method of the references as combined, although not a thin film, might be damaged by bending to the shape of a non-flat adsorption member.

Response to Arguments

9. Applicant's arguments filed June 9, 2005 have been fully considered but they are not persuasive. Applicant argues that Cobbley and the applicant's admitted prior art teach away from the claimed invention because they form the entire stack prior to attaching it to the substrate. The currently drafted claims do not require that the chips be placed one by one on the substrate rather than as a complete stack. Method steps are not limited to the order presented in a claim unless the claim specifically recites the limitation of the listed order.

Applicant also argues that the admitted prior art teaches away from stacking an upper semiconductor element on a lower semiconductor element such that the upper one protrudes from outside shape of the lower one. This is not persuasive because applicant has performed and is currently claiming the method that he purports to be taught away from. If one of ordinary skill in the art would have viewed the teachings in

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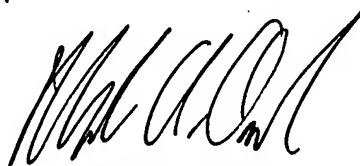
the admitted prior art as teaching away from a protruding upper semiconductor element, then applicant should also have been led away from such an invention as is currently claimed.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark A. Osele whose telephone number is 571-272-1235. The examiner can normally be reached on M-F 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher Fiorilla can be reached on 571-272-1187. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



MARK A. OSELE
PRIMARY EXAMINER
June 25, 2005